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| 10/627,385 | 07/25/2003 | Santosh S. Rao | VRT0089US | 3916 |
| 6/04/29 7590 08/11/2009 CAMPBELL STEPHENSON LLP 11401 CENTURY OAKS TERRACE BLDG. H, SUITE 250 AUSTIN, TX 78758 | | | | |
| EXAMINER | | | | |
| WASEL, MOHAMED A | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/627,385

Applicant(s)

RAO ET AL.

Examiner

MOHAMED WASEL

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12, 13, 15, 17-23, 25 and 28-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12, 13, 15, 17-23, 25 and 28-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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Response to Amendment

This action is responsive to amendment filed on May 6, 2009. Claims 1, 12, 15 and 28 have been amended. Claim 32 has been newly added. Claims 1-10,12,13,15,17-23,25 and 28-3 are pending and presented for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 15 and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Upon further review of the original disclosure of the claimed invention, the cited limitation "**disabling** the first node from accessing the portion of the physical data..." in lines 11 and 12 of claim 1 is not described in the specification and therefore it is considered new matter. Appropriate corrections are required where applicable.

Claims 15 and 28 also recite the same limitation as claim 1 and therefore are rejected under the same rationale and reasoning as claim 1.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-10, 12, 13, 15, 17-23, 25 and 28-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Wipfel et al. (Wipfel) U.S. Patent Application Pub. No. 2005/0268154.

1. As per claim 1, Wipfel teaches a method comprising:

providing a coordinator virtual device corresponding to a portion of a physical data storage device (**Paragraph(s) [0022]**);

detecting when a computer system cluster, including a plurality of nodes, is partitioned (**Paragraph(s) [0013], [0040]**; **cluster detects failure immediately to prevent wide-spread data corruption**);

a first node of the plurality of nodes attempting to gain control of the coordinator virtual device (**Paragraph(s) [0043], [0079]**); and

removing the first node of the plurality of nodes from the computer system cluster in response to the attempting being unsuccessful, wherein the removing comprises disabling the first node from accessing the portion of the physical data storage device (**Paragraph(s) [0041], [0052], [0075]**).

2. As per claim 2, Wipfel teaches the method wherein the providing the coordinator virtual device corresponding to the portion of the physical data storage device further comprises:

selecting the portion of the physical data storage device (**Paragraph(s) [0079]**).

associating a physical description of the portion of the physical data storage device with a coordinator virtual device identifier (**Paragraph(s) [0079]**); and

allowing at least one of the plurality of nodes of the computer cluster to access the portion of the physical data storage device via the coordinator virtual device identifier (**Paragraph(s) [0042]**).

3. As per claim 3, Wipfel teaches the method wherein the providing a coordinator virtual device corresponding to the portion of the physical data storage device is performed by at least one virtual device configuration server (**Paragraph(s) [0024]**).

4. As per claim 4, Wipfel teaches the method wherein the at least one virtual device configuration server is separate from the plurality of nodes of the computer cluster and wherein at

least one of the plurality of nodes of the computer cluster further comprises a virtual device configuration client (**Paragraph(s) [0024], [0029], Fig. 1**).

5. As per claim 5, Wipfel teaches the method further comprising:

reading cluster membership information from the coordinator virtual device corresponding to the portion of the physical data storage device (**Paragraph(s) [0050]**).

6. As per claim 6, Wipfel teaches the method wherein the detecting when the computer system cluster, including the plurality of nodes, is partitioned further comprising:

reading, as performed by one of the plurality of nodes, cluster membership information from the coordinator virtual device corresponding to the portion of the physical data storage device (**Paragraph(s) [0041-0042]**); and

determining whether the cluster membership information indicates that the one of the plurality of nodes is a current member of the computer system cluster (**Paragraph(s) [0065]**).

7. As per claim 7, Wipfel teaches the method further comprising:

writing cluster membership information to the coordinator virtual device corresponding to the portion of the physical data storage device (**Paragraph(s) [0050]**).

8. As per claim 8, Wipfel teaches the method of wherein the coordinator virtual device corresponding to the portion of the physical data storage device further comprises cluster membership information (**Paragraph(s) [0043]**).

9. As per claim 9, Wipfel teaches the method wherein the coordinator virtual device corresponding to the portion of the physical data storage device is a coordinator volume (**Paragraph(s) [0043]**).

10. As per claim 10, Wipfel teaches the method wherein the detecting when a computer system cluster is partitioned further comprises:

monitoring a network coupled to each of the plurality of nodes for a heartbeat signal and determining when the heartbeat signal is not present for a specified period of time (**Paragraph(s) [0040]**).

11. As per claim 12, Wipfel teaches the method encoded in a computer readable storage medium as instructions executable on a processor, the computer readable storage medium being

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one of an electronic storage medium, a magnetic storage medium, and an optical storage medium (**Paragraph(s) [0030]**).

12. As per claim 13, Wipfel teaches the method further comprising:

allowing at least one of the plurality of nodes of the computer cluster to exclusively access the portion of the physical data storage device (**Paragraph(s) [0075]**).

13. As per claim 15, Wipfel teaches a system comprising:

a first data storage device (**Paragraph(s) [0030]**);

a virtual device configuration server coupled to the first storage device and including a first memory and a first processor configured to provide a coordinator virtual device corresponding to a portion of the first data storage device (**Paragraph(s) [0037]**);

a plurality of virtual device configuration clients configured as a computer system cluster, a first of the plurality of virtual device configuration clients including a second memory and a second processor (**Paragraph(s) [0024]**) configured to:

detect when the computer system cluster is partitioned (**Paragraph(s) [0013], [0040]; cluster detects failure immediately to prevent wide-spread data corruption**);

attempt to gain control of the coordinator virtual device corresponding to the portion of the first data storage device (**Paragraph(s) [0043], [0079]**); and

disable the first node from accessing the portion of the first data storage device by removing the first of the plurality of virtual device configuration clients from the computer system cluster in response to the attempt to gain control of the coordinator virtual device being unsuccessful (**Paragraph(s) [0041], [0052], [0075]**).

14. As per claim 17, Wipfel teaches the first data storage device is at least one of a disk drive, a JBOD, a disk array, and an integrated circuit (**Paragraph(s) [0028]**).

15. As per claim 18, Wipfel teaches the system wherein the first data storage device is coupled to the virtual device configuration server via a network (**Paragraph(s) [0024]**).

16. As per claim 19, Wipfel teaches the system wherein the virtual device configuration server is a volume server, wherein the coordinator virtual device is a coordinator volume, and the

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plurality of virtual device configuration clients is a plurality of volume clients (**Paragraph(s) [0043]**).

17. As per claim 20, Wipfel teaches the system wherein the first of the plurality of virtual device configuration clients is further configured to read cluster membership information from the coordinator virtual device corresponding to the portion of the first data storage device (**Paragraph(s) [0050]**).

18. As per claim 21, Wipfel teaches the system of claim 20 wherein the first of the plurality of virtual device configuration clients is further configured to determine whether the cluster membership information indicates that the first of the plurality of virtual device configuration clients is a current member of the computer system cluster (**Paragraph(s) [0041], [0042], [0065]**).

19. As per claim 22, Wipfel teaches the system wherein the first of the plurality of virtual device configuration clients is further configured to write cluster membership information to the coordinator virtual device corresponding to the portion of the first data storage device (**Paragraph(s) [0050]**).

20. As per claim 23, Wipfel teaches the system wherein the coordinator virtual device corresponding to at least a portion of the first data storage device further comprises cluster membership information (**Paragraph(s) [0043]**).

21. As per claim 25, Wipfel teaches the system wherein the first memory and the virtual device configuration server belong to at least one of a host computer system, a cluster node, a storage appliance, a network appliance, and a storage area network (SAN) switch (**Paragraph(s) [0022]**).

22. Claim 28 is rejected under the same rationale as claim 1.

23. Claim 29 is rejected under the same rationale as claim 5.

24. Claim 30 is rejected under the same rationale as claim 7.

25. Claim 31 is rejected under the same rationale as claim 6.

26. Claim 32 is rejected under the same rationale as claim 1.

Response to Argument(s)

Applicant's argument(s) filed on May 6, 2009 have been fully considered but they are not persuasive. Therefore, rejection is maintained.

- In the remarks, the Applicant argues in substance that:
Wipfel fails to teach or suggest removing the first node of the plurality of nodes from the computer system cluster in response to the attempting being unsuccessful, wherein the removing comprises disabling the first node from accessing the portion of the physical data storage device.
- In response to argument(s):
Examiner respectfully disagrees. Applicant is reminded that claims must be given their broadest reasonable interpretation. Wipfel discloses when a split brain occurs due to a node failure, there is a significant risk that the nodes in the opposing partition will corrupt or damage data on the shared storage. Therefore, a determination of whether it is necessary to "freeze out" or "fence off" the silent node(s) and/or block their access to the shared storage has to be determined very quickly in order to mitigate any damage to shared resources and the network (Paragraph [0041], [0052], [0075]). Since Wipfel discloses blocking (disabling) silent nodes (failed nodes) from accessing the shared resources to prevent data damage, Wipfel meets the scope of the claimed limitation as currently presented.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the

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date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohamed Wasel whose telephone number is (571) 272-2669. The examiner can normally be reached on Mon-Fri (8:00 am - 5:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mohamed Wasel/
Patent Examiner, Art Unit 2454
August 5, 2009

/Nathan J. Flynn/
Supervisory Patent Examiner, Art Unit 2454